

COVID-19 VACCINE Q&A

In late 2019, a new coronavirus, SARS-CoV-2, was identified in China. The new virus had two important features. First, it could infect people. Second, infected people could easily spread the virus to others. These characteristics set the stage for a COVID-19 pandemic, or worldwide epidemic, which was declared by March 2020. Knowing the important role that vaccines would play, scientists, pharmaceutical companies and governments immediately started working to develop COVID-19 vaccines. With unprecedented speed, the first vaccines were ready by December 2020. Because vaccines typically take years—if not decades—to create, some have wondered if this shortened timeline has affected COVID-19 vaccine safety. Here we present answers to some frequently asked questions about the COVID-19 vaccine.



Q. What is mRNA?

A. mRNA stands for messenger RNA, which is the blueprint for making proteins. DNA, which lives in the nucleus of cells, makes mRNA and ships it outside the nucleus to the surrounding cell cytoplasm. Once in the cytoplasm, mRNA is translated into a host of cell proteins and enzymes. Because our cells make proteins all the time, they also make mRNA all the time. Soon after making proteins, mRNA breaks down.

Q. How do mRNA vaccines work?

A. COVID-19 mRNA vaccines take advantage of the cellular process of making proteins by introducing mRNA that contains the blueprint for one of the coronavirus proteins, specifically the spike protein. This is the protein that attaches coronavirus to our cells. If we can prevent virus-cell attachment by making antibodies against the spike protein, then we can prevent coronavirus from infecting cells. The mRNA that codes for the SARS-CoV-2 spike protein is taken up by specialized cells of the immune system, called dendritic cells, which put small pieces of the spike protein on their surface, travel to a nearby lymph node, and stimulate other cells of the immune system (B cells) to make antibodies. This is why some people who get the mRNA vaccine have swelling in the lymph nodes under the arm that was inoculated. The antibodies made during this process prevent virus-cell attachment in the future.

Q. Are mRNA vaccines effective?

A. Two companies, Pfizer and Moderna, have made mRNA vaccines. Both vaccines were found to be about 95% effective at preventing COVID-19. This high level of protection extends to people over 65, people with a variety of medical conditions that put them at risk of severe disease, and people with different racial and ethnic backgrounds. Both vaccines were released to the public in December 2020.

During 2021 and 2022, studies will determine whether this high level of protection lasts.

Q. Can mRNA vaccines change a person's DNA?

A. No. In order for mRNA to alter someone's DNA, several events would need to occur. First, mRNA would need to enter the cell nucleus, where DNA resides. However, mRNA does not have the nuclear access signals that would allow it to enter. Put quite simply, mRNA vaccines can't get into the nucleus. Second, even if mRNA did enter the nucleus, it would have to be converted to DNA. This would require an enzyme called reverse transcriptase, which the mRNA vaccines don't contain. Third, the mRNA vaccines don't contain an enzyme called integrase, which would also be needed for mRNA to insert itself into the DNA. In short, the mRNA vaccines lack all of the basic requirements necessary to alter DNA. They remain in the cell cytoplasm for just a few days before they are destroyed. One other thing to remember is that there are more than 200,000 cellular mRNAs making a host of proteins and enzymes. The mRNA vaccines introduce only a few copies of mRNA into cells.

Q. Who should get the COVID-19 mRNA vaccine?

A. Because SARS-CoV-2 virus can affect all people in all age groups, most people should get the COVID -19 vaccine, once supplies allow for their priority group to be vaccinated.

Q. Who should NOT get the COVID-19 mRNA vaccine?

A. A few groups should not get the vaccine, and some others should consult with their doctor or follow special procedures. People who should NOT get the COVID-19 vaccine include:

- Anyone with a severe allergy to an mRNA vaccine component (i.e., one that causes anaphylaxis or requires medical intervention).
- Those younger than 16 years of age.

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- People currently isolating or experiencing symptoms of COVID-19. These people can get vaccinated once they have finished isolation and their primary symptoms have resolved.

People who may get the vaccine after considering risks and benefits and consulting with their healthcare provider include:

- Individuals with a history of severe allergy to any vaccine or injectable medication
- Pregnant women
- Breastfeeding women
- Women who are trying to get pregnant
- People with certain immune-compromising or autoimmune conditions
- People on anticoagulants

People who should follow special procedures after getting the vaccine include:

- Individuals with a history of severe allergy (requiring medical intervention) to anything other than a vaccine or injectable medication can get the vaccine, but they should remain at the vaccination location for medical observation for 30 minutes after receipt of the vaccine.
- Pregnant women who develop a fever after vaccination should take acetaminophen.
- People who recently had COVID-19 and were treated with antibody-based therapies (e.g., monoclonal antibodies or convalescent plasma) should wait until 90 days after treatment to be vaccinated.
- People with a known COVID-19 exposure should wait until their quarantine is over before getting vaccinated (unless they live in a group setting, such as a nursing home, correctional facility, or homeless shelter, in which case they can be vaccinated during the quarantine period).
- People who got another vaccine (non-COVID-19 vaccine) should wait at least 14 days before getting a COVID-19 vaccine. Likewise, if a person got the COVID-19 vaccine, they should wait at least 14 days before getting any other vaccines (non-COVID-19 vaccines).

Q. How many doses of a COVID-19 mRNA vaccine are needed?

A. The mRNA vaccines require two doses. For the Pfizer vaccine, doses should be separated by 21 days. For Moderna's vaccine, doses should be separated by 28 days. The two mRNA vaccines are NOT interchangeable. A person

should be sure they know which one they got as the first dose and be clear about when they should return for the second dose, particularly because both doses of the vaccine are required to have the best protection. However, even if more than the recommended time interval has elapsed between the first and second dose, the series doesn't need to be restarted. It can just pick up where it was left off.

Q. Are mRNA vaccines safe?

A. Yes. But, both mRNA vaccines do cause side effects as a consequence of the immune response to the SARS-CoV-2 spike protein produced by the mRNA. Side effects occur more often after the second dose and are more common in people younger than 55 years of age. In some ways, the more vigorous the immune response, the more common the side effects. The most common side effects from the mRNA vaccines are: fatigue, headache, muscle aches, low-grade fever, chills and joint pain. Typically, these side effects last for only one or two days. Although most people will not have significant side effects, some people may wish to schedule their vaccination so that they will not need to call out of work the next day if they don't feel well.

Q. What ingredients are in the mRNA vaccines?

A. The mRNA vaccines contain:

- mRNA – The mRNA is for the spike protein of SARS-CoV-2, the virus that causes COVID-19.
- Lipids – These are molecules that are not able to dissolve in water. They protect the mRNA so that it does not break down before it gets into our cells. These lipid particles can be thought of as little “bubbles of fat” that surround the mRNA like a protective wall and make it easier for the mRNA to enter cells.
- Salts – Salts, similar to table salt, are used to keep the pH of the vaccine close to that found in the body, so the vaccine does not damage cells when it is administered.
- Sugar – This ingredient is the same as the sugar you put in your coffee or on your cereal. In the vaccine, it helps keep the “bubbles of fat” from sticking to each other or to the sides of the vaccine vial.

mRNA vaccines do NOT contain blood products, antibiotics, DNA, fetal cells, pork products, egg proteins or preservatives (e.g. thimerosal).

Q. If I had COVID-19, do I need the vaccine?

A. Yes. People who have had COVID -19 are recommended to get the vaccine after they have recovered. The Pfizer vaccine trial included people who were previously infected with SARS-CoV-2, and the vaccine was found to be safe and highly

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effective. Because we do not know how long antibodies last after infection and a small number of people have had more severe second bouts of infection, the vaccine can be beneficial in boosting a person's existing immunity from infection.

Q. Can a person spread the virus after they are vaccinated against COVID-19?

A. mRNA vaccines against COVID-19 have been shown to be highly effective at preventing disease, but they might not prevent infection without symptoms. What this means is that if a vaccinated person can still be infected, even without symptoms, they could spread the virus. Studies will soon be completed to determine whether this is possible. However, given this uncertainty, vaccinated people should still use masks and practice social distancing measures.

Q. How well does the mRNA vaccine work?

A. More than 9 of every 10 people vaccinated during the clinical trials were protected from disease. This number may decrease a bit as the vaccines are given to the general population because the conditions during a clinical trial tend to be optimal, so they measure the best case scenario. However, it is still expected that most people who get both doses of the vaccine, according to the time interval recommended, will be protected.

Q. Will booster doses or annual vaccines be needed?

A. Since the first people in the trials were vaccinated at the end of July 2020 and the first vaccines were approved in December 2020, we only have information about protection against disease for a few months after vaccination. The degree to which these vaccines protect against COVID-19 one or two years after vaccination will be determined later. Trial participants will continue to be monitored, so we will learn more, but we do not yet know whether booster doses will be needed.

Q. How long will vaccine immunity last?

A. We do not yet know how long immunity lasts after infection or vaccination:

- Infection - Scientists are working to learn more about immunity following infection. While some people have been re-infected after recovering from COVID-19, the number of people who have experienced this is small compared with the total number of people who have been infected. Likewise, although the virus has been changing since it was first recognized, antibodies from people who were sick early during the pandemic are still

effective against the slightly modified version. For these reasons, scientists are hopeful that people will be protected for one or more years.

- Vaccination - Clinical trial participants will be monitored to understand how long immunity lasts after vaccination.

Q. Does the mutation of coronavirus affect the capacity of vaccines to prevent disease?

A. Although SARS-CoV-2 is constantly mutating, the virus that causes COVID-19 does not appear to have functionally changed in a way that would disable the vaccine. Likewise, antibodies from people who had an earlier version of the virus are still able to protect against the newer version.

Q. When can I get the vaccine?

A. Because COVID-19 vaccine supplies will initially be limited, Humboldt County is following the State of Nevada's "Prioritization Lanes" plan for dispensing the vaccine to Humboldt County residents, beginning in December 2020 and continuing through 2021.

Tier 1 - Projected timeline: December 2020 - January 2021

- Healthcare workers at Humboldt General Hospital
- Residents living in skilled nursing and assisted living facilities
- Emergency medical services personnel

Prioritization Lanes: General Population - Projected Timeline: January 2021 - To Be Determined

- Community residents ages 70 and older (**ongoing**)
- Community residents ages 65-69 years (**ongoing**)
- Community residents ages 16-64 years with underlying conditions, residents with disabilities, and residents experiencing homelessness
- Healthy community residents ages 16-64 years
- Nevada Department of Correction inmates will be vaccinated following the same tiered prioritization as the general population

Prioritization Lanes: Workforce/Essential Workers - Project Timeline: January 2021 - To Be Determined

- Public Safety and Security (**complete**)
 - Nevada Department of Corrections Staff
 - Law Enforcement, Public Safety and National Security
 - State/Local Emergency Operations Management/Staff
- Frontline Community Support (**ongoing**)
 - Education and Childcare
 - Community Services (Food, Shelter, Court/Legal, Social

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- Services)
 - Continuity of Governance (State and Local)
 - Essential Public Transportation
 - Remaining Essential Public Health Workforce
 - Mortuary Services
- Frontline Supply Chain and Logistics
 - Agriculture and Food Processing
 - Manufacturing, Transport, Distribution and Sale of Essential Items
 - Utilities and Communication Infrastructure
 - Nevada Department of Transportation and Local Emergency Road Personnel
 - Frontline Airport Operations
 - Other Essential Transportation
- Frontline Commerce and Service Industries
 - Food Service and Hospitality
 - Hygiene Products and Services
 - Depository Credit Institution Workforce
- Frontline Infrastructure
 - Infrastructure, Shelter and Housing (Construction)
 - Essential Mining Operations
- Other
 - Community Support Administrative Staff
 - Nevada System of Higher Education Students Living in Campus-Sponsored Residential Settings
 - Nevada System of Higher Education Remaining Workforce

information is available via the recorded information line, local and social media, healthcare offices, local businesses and more.

Q. Where and where can I get vaccinated?

A. Groups in Tier 1 have been vaccinated. Groups in the “Prioritization Lanes” will be notified of available vaccination opportunities by Humboldt County Emergency Management or via the community’s communication and media channels, healthcare offices, local businesses and more.

Q. How will I know when my vaccination opportunity arrives?

A. The Humboldt County Health Board has launched a recorded information line in English and Spanish for COVID-19 vaccine information. Residents may call (775) 375-3200 to hear the latest information about vaccine allocations, local distribution opportunities, and changes as they occur; messages are updated every Monday and Thursday, or as needed. While it’s never certain when COVID-19 vaccines will arrive in Humboldt County, health officials are always ready when they do. In the meantime, residents are encouraged NOT to call the Community Health Nurse, Humboldt General Hospital, Humboldt County or others to request inoculations or information unless specifically asked to do so. Updated